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USAAVRADCOM TECHNICAL REPORT 78-1

A COMPUTERIZED LOG FOR SYSTEMS AND COST ANALYSIS DIVISION COST ESTIMATE CONTROL DATA CENTER (CECDC) VALIDATION ACTIVITY

JOANNE A. RAGAN

JANUARY 1978

FINAL REPORT

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Prepared For:

U.S. ARMY AVIATION RESEARCH AND DEVELOPMENT COMMAND
Directorate for Plans and Analysis
Systems and Cost Analysis Division
Data Analysis and Control Branch
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Product Improvement Program (PIP), Computerized Log, Tracking, Validation Record, Activity Log, Engineering Change Proposal (ECP), Economic Analysis (EA), Cost Analysis.

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Responsibility for validating and/or reviewing documents containing "cost estimates" has been assigned to the CECDC function of DRDAV-BC. In order to utilize the speed and accuracy available with automatic data processing, a computer program has been developed to process the appropriate information from these documents, to aid in preparation of the necessary reports and to provide a historical log of the documents which have been processed. The logging procedure includes portions accomplished manually as well as the

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IV

20. ABSTRACT (Continued).

portion produced by the computer. After a document has been validated (or rejected) by a CECDC analyst, specific information is logged before the document is returned to the proponent. Periodically, these records are key punched onto IBM punch cards, which are then processed by the IBM 360/65 computer using the specially designed "Computerized Log Program." Within the computer, data records are sorted by aircraft system, and are then printed out in group arrangement according to type of validation, aircraft type, and month.

SUMMARY

The purpose of this programming task has been to prepare a computerized method of storing, maintaining and presenting data concerning review and/or validation actions required of the Systems and Cost Analysis Division CECDC. An original computer program has been expanded from a basic program developed several years ago to handle ECP's. The resultant listing can be used to prepare reports; also, it will provide an overview of the validation activity through DRDAV-BC CECDC. A set number of aircraft system codes are built into the matching subprogram, though other systems codes can be quite easily added when required. In addition to matching specific aircraft systems, the program matches nine types of documents. The printout is in terms of (1) type of document validated, (2) aircraft or other system involved, and (3) validations on a monthly basis. Any information on a "new" or "non-matched" system will be printed in a general category called "other validations."

ACKNOWLEDGEMENTS

The following people from Systems and Cost Analysis Division (DRDAV-BC), or formerly from Cost Analysis (Comptroller) were responsible for this programming effort:

a. Mr. Donald Mathusz produced the original project design and program. Mr. Mathusz was assisted in this by several Comptroller Interns.

b. Mrs. Margaret Mulligan and Mr. Michael Bryant produced and enhanced project designs throughout the various stages of production and, as project team leaders, established a timely and useful report.

c. Mr. Earl Krueger's expertise was invaluable in designing the data base format and in structuring the computer program.

d. Clerical assistance was provided by Misses Joan Ficker, typing, and Dottie Folle and Barbara Kasper, keeping the manual logs.

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I. BACKGROUND.

For several years, the Systems and Cost Analysis Division CECDC supervisory personnel have stressed the need for a systematic method of maintaining information concerning reviews and validations performed by the staff. The original computerized effort of this task was accomplished in 1973-74 when computer programs were developed for "ECP Series Sort" and "PIP Series Sort." At that time the plan was to develop a set of programs such that each program maintain a logical subset of the data available. The entire system of programs would have recorded, stored, and presented a complete data bank for ECP's and PIP's. One primary goal of this data bank was to make the manual preparation of quarterly reports less time-consuming.

Several modified versions of the "Series Sort" programs have been developed and expanded through the years until the present Computerized Validation Log Program has resulted. The Computerized Validation Log Program has been expanded so that one program maintains all selected data applying to the seven most active types of reviews and validations, plus a general category for other types of Systems and Cost Analysis Division projects.

II. SCOPE.

The Computerized Validation Log Program is designed to be a data base program as opposed to a high-powered model which would be characterized by speed and accuracy of complex computations.

Data is entered in chronological order, (i.e., by the date the document enters Systems and Cost Analysis Division CECDC for processing; each validation or review is recorded on one computer card. Each card of input data contains a document type code (e.g., PRIMIR = 30), CECDC control number, dates document enters and leaves Systems and Cost Analysis Division CECDC; actual time, in man-hours, spent to do the analysis; identification of the primary Analyst on the project, the document's proponent office; and aircraft type, model and series. Also given for each document are the following: document number, such as PIP number; Revision number, base year, short title of the project, the CECDC return code, the type of analysis used, the justification, the level of validation, funds type, the economic adjustment type, the exceptions to the Economic Analysis, and the reason if rejected.

The purpose of the Log Program is to provide a standardized means of collecting, storing, maintaining and retrieving certain data items (listed above) in reference to a specific group of actions required of DRDAV-BC CECDC. Data is manually recorded as each project is completed so there is a resulting (necessary) ordering by month; the method of recording saves further coding into keypunch format. After being keypunched, the data is fed into the FORTRAN Program which sorts it by document type and by aircraft type, model and series.

III. METHODOLOGY.

As tasks are processed by DRDAV-BC CECDC and if they require review and/or validation, they are entered on a manual log which is later keypunched and the information is fed into the computer to produce automated reports.

Since the computer card is designed for 80 columns or characters of information per card, the description of each action is coded so that all the information fits within the 80 characters. Table 1.1 shows the 80 characters per card as well as the codes used.

Sorting the actions by type of action and by aircraft system (type, model, and series) is accomplished through matching against tables which are build into the program. Specific aircraft systems and document types now built into the sort are listed in Table 1.3.

IV. GENERAL OPERATING INSTRUCTIONS.

The Computerized Log Program is written in FORTRAN IV level G. It requires 162K of core and 34 seconds CPU time (9.7 sec for Go step only.) A maximum of 400 activity cards can be input at a time and they must be in chronological order by the month received into DRDAV-BC CECDC. A maximum of three comment cards can follow any validation record in order to further explain the validation level of that action.

If more than 400 basic cards of input are to be run, a change must be made to the dimension statements in the source program and in the subprograms.

Although the present input method is punched cards, the data could be written to magnetic tape and then processed from the tape. Historical data can easily be re-accessed from magnetic tape files, as required.

TABLE 1.1 VALIDATION LOG INPUT DATA FORMAT

CC	ITEM NAME
1-2	Document Type
3-8	CECDC Control Number
9-12	Date Received by DRDAV-BC CECDC (Month, day)
13-16	Date Released by DRDAV-BC CECDC (Month, day)
17-19	Man-hours Required for the Assignment
20-22	CECDC Analyst
23-27	Originating or Proponent Office
28-36	Aircraft System
28-29	Type
30-31	Model
32-36	Series
37-45	PIP/ECP Number
46-47	Revision (If any)
48-49	Base Year Dollars
50-54	Total Adjusted Program Dollars
55-72	Document Title, Abbreviated
73	Unanalyzed Return Code
74	Type of Analysis
75	Project Justification
76	*Validation Level
77	Funds Type
78	Economic Adjustment Type
79	Exceptions to an Economic Analysis
80	Reject Code

NOTE: *Up to three comment cards can follow to explain the validation level.

TABLE 1.2 EXPLANATION OF CODES

COL 74, TYPE OF ANALYSIS.

1. Economic Analysis.
2. Benefit Analysis.
3. Sensitivity Analysis.
4. Uncertainty Analysis.
5. Cost Comparison.
6. Other.

COL 78, ECONOMIC ADJUSTMENT TYPE.

1. Aircraft.
2. Electronic.
3. RDT&E.
4. OPA.
5. OMA.
6. MPA.
7. Stock Fund.

COL 79, EXCEPTIONS TO AN ECONOMIC ANALYSIS.

1. Total dollars involved does not warrant an Economic Analysis.
2. Directed by higher authority, no alternative.
3. Congress Directed.
4. Other.

COL 80, REASON FOR REJECTION.

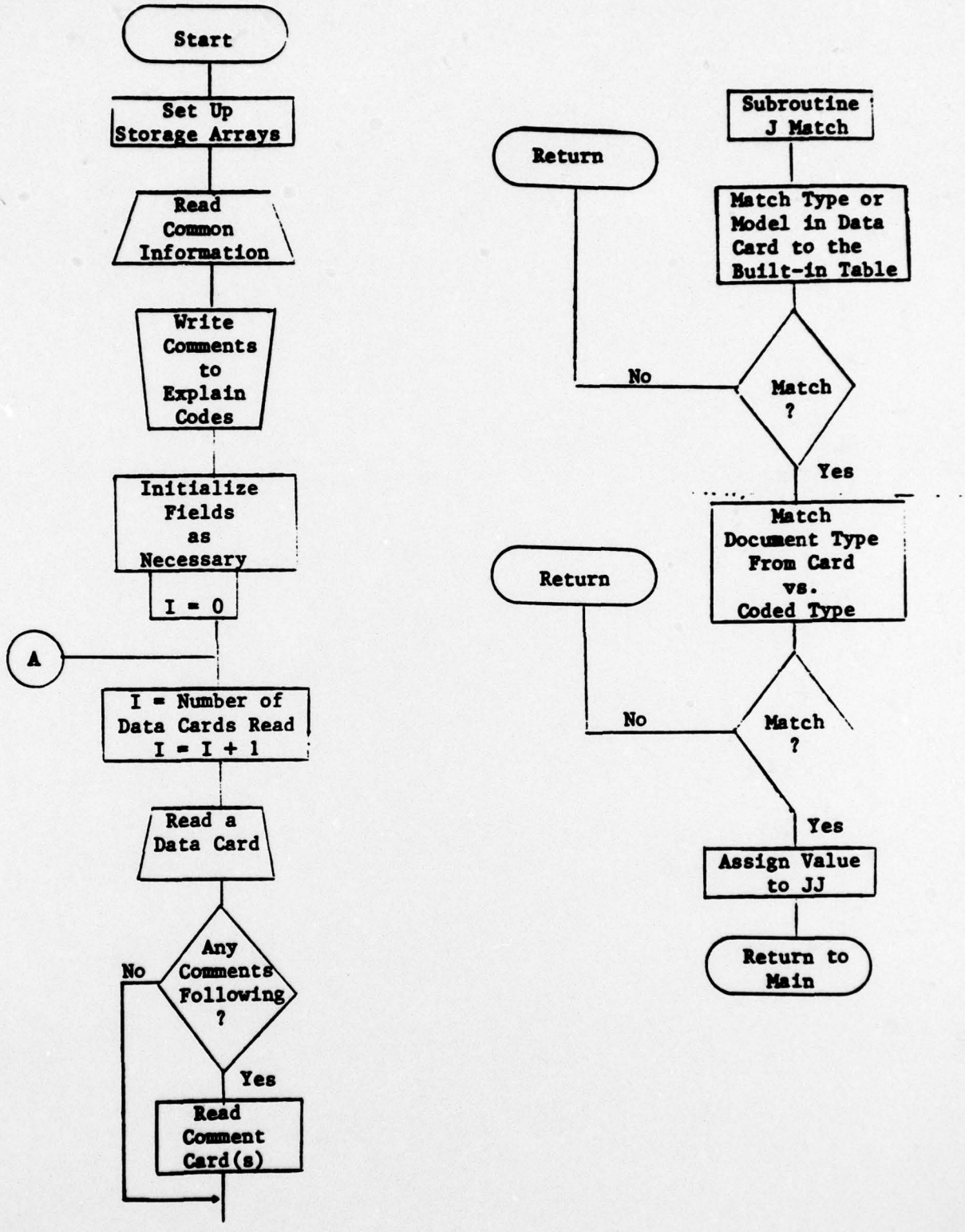
1. Benefit does not justify investment.
2. Not cost effective.
3. Deferred.
4. No requirement.
5. Other.

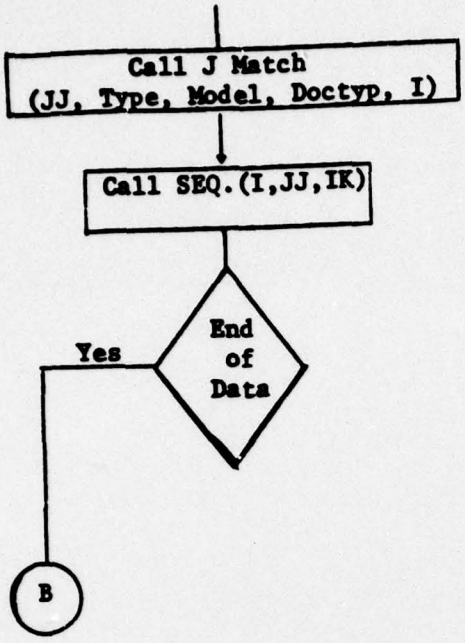
TABLE 1.3 CODES FOR MATCHING

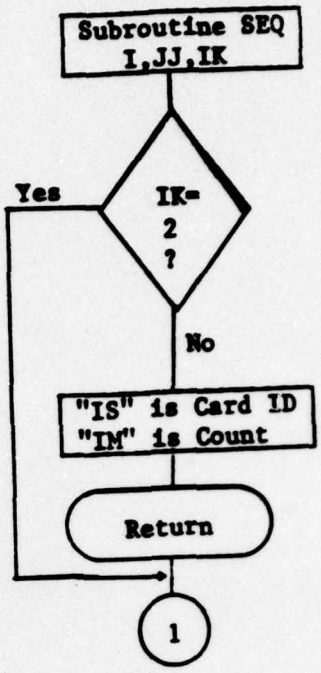
AIRCRAFT/ENGINES	DOCUMENT TYPES
AH-1	Baseline
CH-47	DAPR
CH-53	ECP
CH-54	Operating Cost
OH-6	PIP
OH-58	POM
OV-1	PRIMIR
RU-8	RECAP
RU-21	SAR
T-42A	
T-55	
T-73	
T-74	
TH-1G	
TH-55	
U-1	
U-8	
U-21	

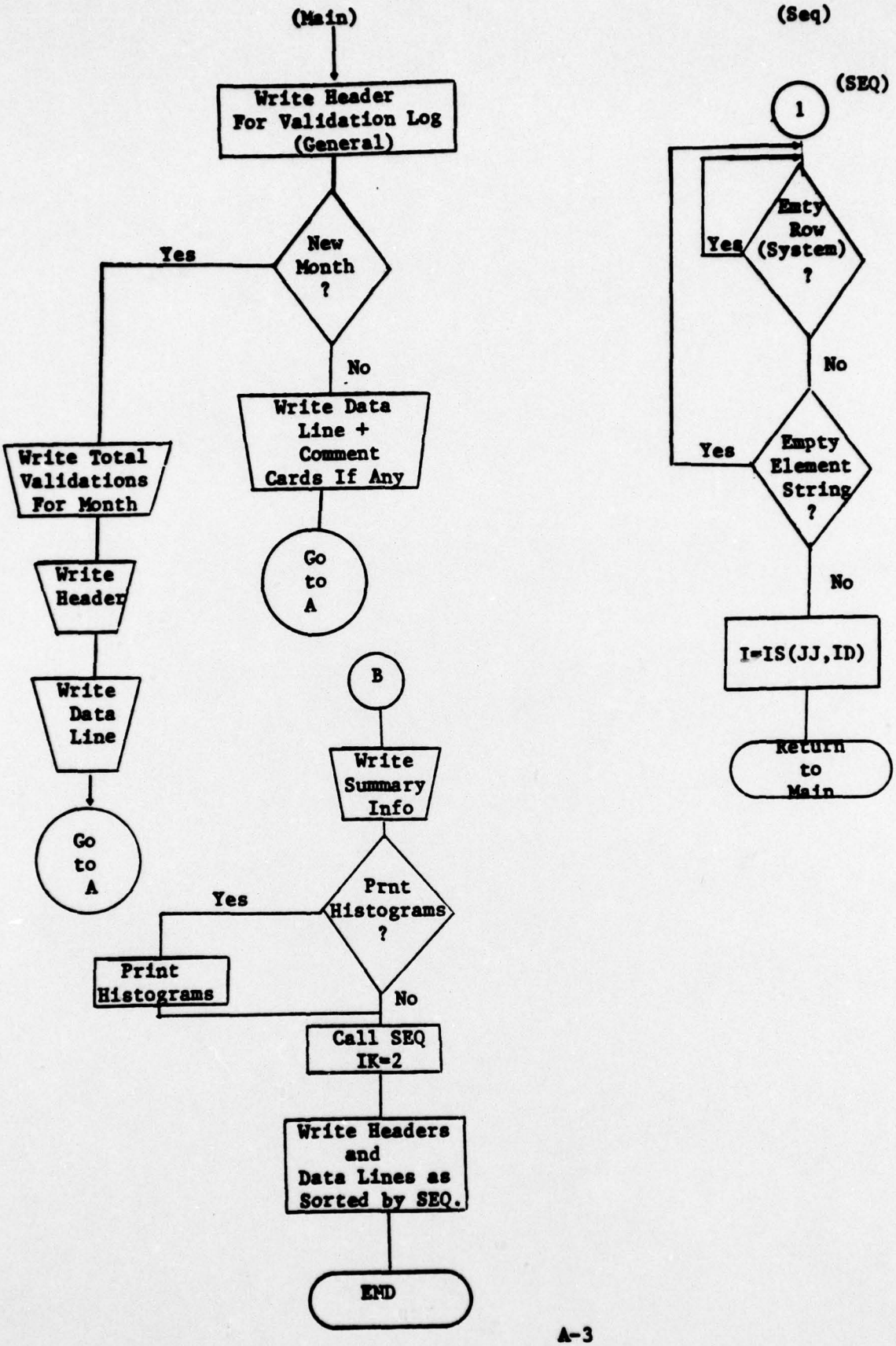
APPENDIX A: FLOW DIAGRAM OF PROGRAM LOGIC

APPENDIX A: FLOW DIAGRAM OF PROGRAM LOGIC




Call J Match
(JJ, Type, Model, Doctyp, I)
Call SEQ.(I,JJ,IK)
End of Data
Yes
B


Subroutine SEQ
I,JJ,IK
IK= 2 ?
Yes
No
"IS" is Card ID
"IM" is Count
Return
1


(Main)
Write Header For Validation Log (General)
New Month ?
Yes
No
Write Total Validations For Month
Write Header
Write Data Line
Go to A
Write Data Line + Comment Cards If Any
Go to A
B
Write Summary Info
Prnt Histograms ?
Yes
No
Print Histograms
Call SEQ IK=2
Write Headers and Data Lines as Sorted by SEQ.
END
(Seq)
(SEQ)
1
Emty Row (System) ?
Yes
No
Empty Element String ?
Yes
No
I=IS(JJ,ID)
Return to Main

APPENDIX B: PRINTED OUTPUT

USAAVRADCOM
DIRECTORATE FOR PLANS AND ANALYSIS
SYSTEMS AND COST ANALYSIS DIVISION
VALIDATION LOG
YR SUBMITTED FOR VALIDATION 77
PIP PROGRAM FISCAL YEAR 79

DOC TYP	CECDC CNTL #	DATE RECD	DATE RELEASED	MAN HRS	CECUC ANAL	OFFICE ORIGIN	AIRCRAFT SYSTEM	UOC NUMBER	BASE YEAR	TOTAL ADJUST PGM $	UOC TITLE	CODES C1 C2 C3 C4 C5 C6 C7 C8
10	77-135	1-19	1-19	0.5	MM	ASF	OV 10	1/50108271C1	77	9.19	AN/ALQ-147	0 1
10	77-136	1-20	1-21	1.0	WG	EV	FH 1H	1/5010H35ES	77	631.42	QUICK-FIX	0 1
10	77-137	1-20	1-21	1.0	AG		FH 1H	1/790116B5BS	77	201.02	MULTIMEWS	0
10	77-138	1-24	1-24	1.0	AG	OOW			0	0.00	DAIHAN WU UNTRACJ	0 4
10	77-139	1-24	1-24	2.0	JM	E			0	0.00	PHOP LR FOR SPERS	0 2
10	77-141	1-21	2- 4	3.0	JM	E			0	0.00	PHOP LR FOR SPAUL	0 2
			THERE WERE 137 TRANSACTIONS THIS MONTH									
		MONTH NUMBER 2										
10	77-142	2- 8	2-11	4.0	BL	E			0	0.00	IMPLT ESC SYS FOR	0 A 2
			THERE WERE 1 TRANSACTIONS THIS MONTH									
		MONTH NUMBER 1										
10	77-143	1-28	2-14	2.0	AG	T			0	0.00	GREECE FMS CASE	0 2
			THERE WERE 1 TRANSACTIONS THIS MONTH									
		MONTH NUMBER 2										
10	77-144	2-11	2-14	2.0	FH	T			0	0.00	FMS CUST DATA ISR	0 2
10	77-145	2-14	2-15	21.0	T&E	47M			0	0.00	PHELIM HV FUNU PR	0 3
10	77-146	2-16	2-16	2.0	AG	T			0	0.00	FMS CASE DA JORD	0 3
10	77-147	2-18	2-22	2.0	AG	T			0	0.00	FMS GREECE CDAE	0 2
10	77-148	2-17	2-18	16.0	CP	AAH			0	0.00	AAH MUTE YMLY CST	0
10	77-149	2-14	2-22	36.0	CP	AAH			0	0.00	TADS/PNVS OCL	0
10	77-150	2-24	0- 0	14.0	EK	UA			0	0.00	UTTAS OCE UPDATE	0 3
10	77-151	2-24	2-28	2.0	AG	T			0	0.00	FMS CASE DA IHAN	0 2
			THERE WERE 8 TRANSACTIONS THIS MONTH									
		MONTH NUMBER 3										
10	77-152	3- 2	3- 2	2.0	DW	AE			0	0.00	CEFLY LAN A/C	0 2
10	77-153	3- 7	3- 7	2.0	AG	T			0	0.00	FMS CASE DA IHAN	0 2
			THERE WERE 2 TRANSACTIONS THIS MONTH									
		MONTH NUMBER 2										
10	77-154	3-23	3-10	8.0	JM	E			0	0.00	DPLOAD FLIR AUG C	0 2
			THERE WERE 1 TRANSACTIONS THIS MONTH									
		MONTH NUMBER 3										
10	77-155	3-15	3-15	2.0	MM		OV 1	177010310	0	0.16	MR-J5U EJECT SEAT	0 1
10	77-156	3-15	3-16	1.0	TM	ASE	UH 1H	1790113798S	0	6.73	XM130,UH-1	0 1
10	77-157	3-15	3-16	1.0	TM	ASE	UH 1H	1/50101300I	0	7.03	MUTMLTAL,PLUM BUP	0 1
10	77-158	3-15	3-15	1.0	MM	CC			0	0.00	LCC,SOTAS RPVCDEA	0 2
			THERE WERE 4 TRANSACTIONS THIS MONTH									
		MONTH NUMBER 2										
10	77-159	2-28	3-14	40.0	CP	AAH			0	0.00	AAH 6013 WU PNUG	0 1

APPENDIX C: GLOSSARY

GLOSSARY OF ACRONYMS

CECDC	-	Cost Estimate Control Data Center
CPU	-	Central Processing Unit (computer)
DRDAV-BC	-	Office Symbol for Systems and Cost Analysis Division, USAAVRADCOM
EA	-	Economic Analysis
ECP	-	Engineering Change Proposal
FORTRAN	-	Formula Translation, a computer language
MPA	-	Military Personnel, Army appropriation
OMA	-	Operation and Maintenance, Army appropriation
OPA	-	Other Procurement, Army appropriation
PIP	-	Product Improvement Program
POM	-	Program Objective Memorandum
PRIMIR	-	Product Improvement Management Information Report
RDT&E	-	Research, Development, Test and Evaluation
USAAVRADCOM	-	United States Army Aviation Research and Development Command